

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/01/2011 has been entered.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over BREDT et al. (2001/0050031) and in further view of ITO et al. (2003/0157317).

Regarding Claim 2, BREDT et al. discloses a method for the manufacture of a three-dimensional object comprising the following steps:

- a first layer of a mixture of particulate material is deposited onto a downwardly movable surface on which an article is to be built, before any fluid has been delivered (Page 3, [0032]) (applying a layer of particles onto a target surface);
- an electromechanical ink-jet nozzle delivers an activating fluid to a portion of the said layer of particulate material (Page 4, [0039]); within a few minutes after the said activating fluid is delivered to the said particulate mixture, the fluid (with adhesive dissolved or suspended therein) infiltrates the less-soluble and slightly-porous particles (wherein the particles that are

used contain at least one cavity and are at least partially dissolved by the jet of liquid), forming adhesive bonds between the filler and the fiber, the activating fluid is capable of bonding the particulate mixture in an agglomerated mass that is several times the mass of a droplet of the fluid (Page 4, [0042]) (irradiating a selected part of the layer that corresponds to a cross-section of the object with a jet of liquid such that the particles in the selected part become connected to each other);

- radiation is used to solidify or cure the particulate mixture (Page 7, [0070]); and
- the said previous steps of applying a layer of particulate mixture, applying the fluid, and indexing the movable surface downward are repeated until the final article is completed (Page 5, [0045]) (repeating the steps of application and irradiation such that the connected parts of adjacent layers connect to each other to form the object).

BREDT et al. discloses that the particles are reactive and can be solidified by applying ultraviolet radiation (Page 7, [0070]). BREDT et al. discloses that the particles are at least slightly-porous (Page 4, [0042]) and when it is irradiated, the pores of the particles will inherently be preserved after solidification or curing by the radiation from the ultraviolet. Furthermore, BREDT et al. teach that the size of the empty pores of the particles persists (or preserved) in the material after the adhesive has hardened [0055].

BREDT et al. is silent to the volume fraction of the said empty pores (cavities) of the particles but discloses that the final strength of the finished article depends largely on the quality of the adhesive contacts between the particles of the mixture, and the size of the empty pores that persist in the material after the adhesive has hardened; both of these factors vary with the grain size of the particulate material. In general, the mean size of the grains of particulate material should not be larger than the layer thickness. A distribution of grain sizes increases the packing density of the particulate material, which in turn increases both article strength and

dimensional control (Page 6, [0055]). BREDT et al. discloses such particles are inorganic compounds such as aluminum oxide or silicon dioxide (Page 2, [0021]) and ITO et al. teach inorganic particles that are aluminum oxide or silicon dioxide that provide high strength and durability for products ([0081]–[0081] and [0001]). Such inorganic particles comprise void ratio ranging above 20% by volume [0083]. It would have been obvious to one of ordinary skill in the art to have substituted the inorganic particle comprising volume fraction ranging above 20% as taught by ITO et al. for the inorganic particle of BREDT et al. because BREDT et al. discloses that the final strength of the finished article depends largely on the size of the empty pores that persist in the material after the adhesive has hardened and ITO et al.'s inorganic particle, which is also hardened by irradiation [0069], with a volume fraction ranging above 20% provides strength and durability for the article.

### ***Response to Arguments***

Applicant's arguments filed September 1, 2011 have been fully considered, but are moot in view of the new grounds of rejection necessitated by the amendment.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STELLA YI whose telephone number is (571)270-5123. The examiner can normally be reached on Monday - Thursday from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SY

/JEFF WOLLSCHLAGER/  
Primary Examiner, Art Unit 1742